RF CURRENT MONITORING PROBE

1 Introduction

The TBCP2-250 is a snap-on RF current monitoring probe, expanding the Tekbox product range of affordable EMC pre-compliance test equipment.
The probe has a very flat response with a 3dB bandwidth of 300 MHz and is characterized and usable in the frequency range from 1kHz to 400 MHz.

Picture 1: TBCP2-250 RF current monitoring probe

The aperture of the RF current monitoring probe is 32 mm. Its transfer impedance is 13 dB Ohm, with a 3 dB bandwidth from 300 kHz – 300 MHz.

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2 Specification

Characterized / usable frequency range: 1 kHz to 400 MHz
Aperture diameter: 32 mm
Outside diameter: 73 mm
Height: 20 mm
Weight: 320 g
Connector type: N female
Transfer impedance: 13 dBΩ in the flat region, typ.
3 dB bandwith: 300kHz – 300 MHz, typ.
Max. primary current (RF): 3 A
Max. core temperature: 125 °C

RoHS

3 Transfer impedance

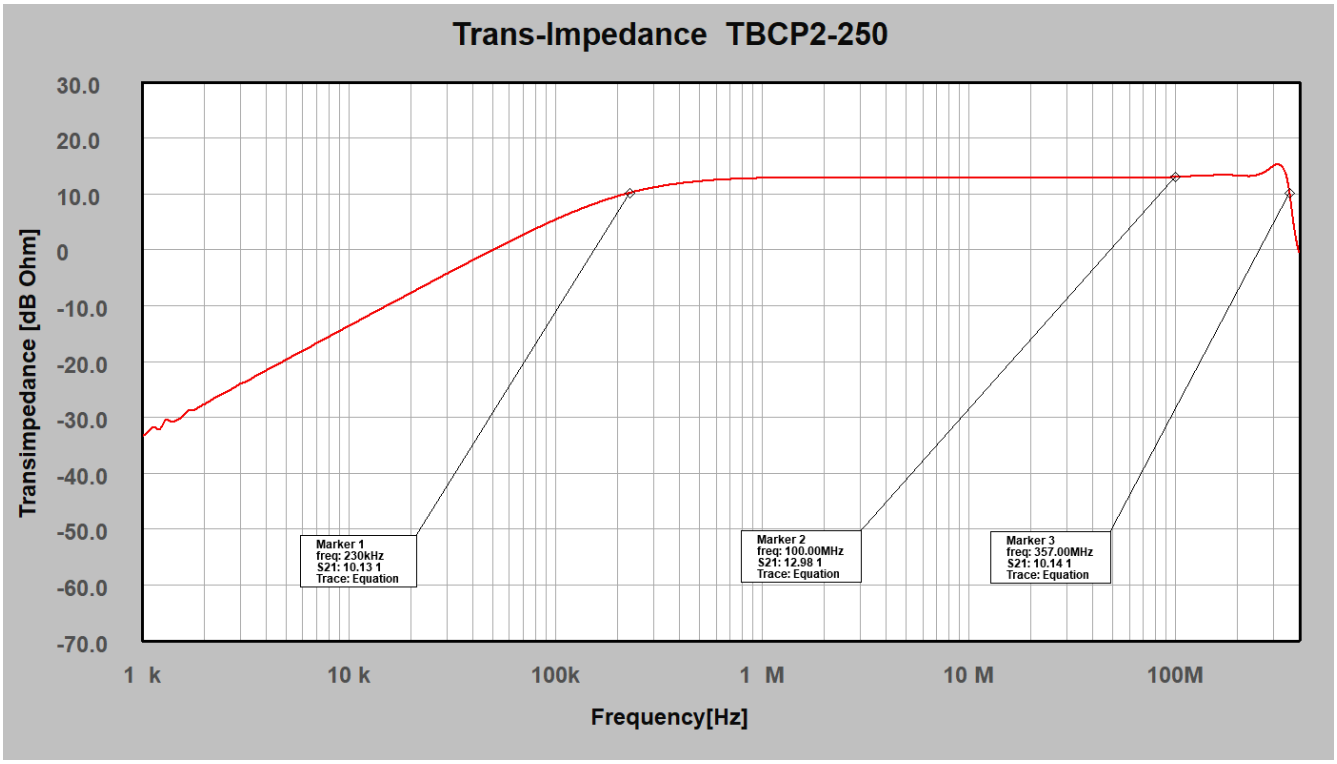

Figure1: typical transfer impedance: 1 kHz to 400 MHz

4 Typical transfer impedance table

The table below shows typical transfer impedance data of a TBCP2-250 current probe. Each current probe is delivered with its corresponding measurement protocol. This data can be used for the creation of a correction file for EMCview or similar EMC measurement software. The transfer impedance in dBΩ subtracted from the analyzer reading in dBµV gives the corrected reading in dBµA.
Refer to the application notes of EMCview on how to create a current probe correction file.

Frequency [MHz]	Transfer impedance [dBΩ]	Frequency [MHz]	Transfer impedance [dBΩ]
0.001	-33,53	25	12,83
0.0025	-25,74	50	12,82
0.005	-19,75	75	12,84
0.0075	-16,22	100	12,98
0.01	-13,74	125	13,13
0.0125	-11,80	150	13,27
0.015	-10,24	175	13,30
0.0175	-8,94	200	13,19
0.02	-7,79	225	13,11
0.025	-5,88	250	13,34
0.05	-0,08	260	13,55
0.075	3,17	270	13,82
0.1	5,32	280	14,20
0.125	6,83	290	14,63
0.15	8,85	300	15,00
0.175	9,52	310	15,20
0.2	11,08	320	15,12
0.25	11,82	330	14,70
0.5	12,21	340	13,82
0.75	12,64	350	12,08
1	12,79	360	9,16
2.5	12,83	370	5,70
5	12,78	380	2,72
7.5	12,80	390	0,52
10	12,81	400	-1,27

Table1: Transfer impedance: 1 kHz to 400 MHz, typical data

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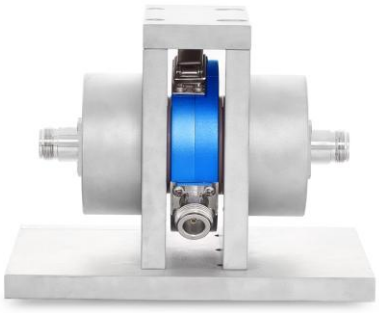
5 Accessory

Tekbox supplies a calibrator corresponding with the TBCP2 series of snap on current probes:



Picture 2: TBCP2-CAL RF current probe calibration fixture

6 Warning

RF current monitoring probes are primarily used for common mode disturbance measurements, where forward and return current pass the aperture in opposite directions and the magnetic field cancels out. When doing differential mode measurements or just passing a single current carrying wire through the aperture, EUTs with high inrush currents may cause a voltage transient, that might damage the receiver or analyzer frontend. Protect your equipment using attenuators, limiters, or disconnect the RF-input, while powering ON/OFF the EUT.

7 Ordering Information

Part Number	Description
TBCP2-250	Snap on RF current monitoring probe, wooden box, calibration protocol 1 kHz – 400 MHz
TBCP2-CAL	Calibration fixture for TBCP2 current probe series

8 History

Version	Date	Author	Changes
V 1.0	7.12.2020	Mayerhofer	Creation of the preliminary document
V 1.1	28.1.2021	Mayerhofer	Photo update
V 1.2	2.6.2021	Mayerhofer	data update after mechanical modification
V 1.3	25.3.2024	Mayerhofer	Extended data to 1kHz – 400 MHz
V 1.4	12.7.2025	Mayerhofer	Chapter 6 added